

SECTION 811

TELEVISION INSPECTION

I. GENERAL

1.1 DESCRIPTION OF WORK

The Work covered by this section consists of providing all labor, equipment, material and supplies and performing all operations required to conduct the internal closed-circuit television inspection of all designated sewer lines. The Contractor shall be responsible for removing his equipment from the sewers and for all associated sewer and restoration repairs necessary as a result of his Work.

Definitions:

- A. Pre-Installation TV Inspection: Pre-installation TV is a video inspection by the Contractor of sewer lines specified for rehabilitation to confirm cleaning, location of service connections, and constructability of line rehabilitation in accordance with the contract documents.
- B. Post-Installation TV Inspection: Post-installation TV is a video inspection to determine that rehabilitation and/or replacement of sanitary sewers has been completed in accordance with the contract documents.
- C. TV Inspection Log: Information collected and recorded by each TV operator for any TV inspection effort and shall include all pertinent information for the respective inspection section.
- D. PACP: Pipeline Assessment and Certification Program. A voluntary CCTV Inspection Standardization certification and observation coding system sponsored by the National Association of Sewer Service Companies (NASSCO).

1.2 SUBMITTALS

Submittals shall be made by the Contractor in accordance with the procedures set forth in Section 105 - Control of Work, and as described below.

- A. Compact Disc (CD), or Digital Video Disc (DVD): The storage media shall be specified by the Owner: See Section 200 - Products and Materials
- B. TV Inspection Log: Each TV Inspection Log shall be submitted to the Owner accompanied by the respective video tape.
- C. PACP Operator Certification: Prior to initiating CCTV inspection work associated with condition assessment assignments, the Contractor shall present the Owner with copies of PACP certifications of operators that will be performing the Work.

II. EXECUTION

2.1 GENERAL

- A. The designated sewer pipe sections shall be televised in accordance with the Contract Documents.
- B. Equipment:
 - 1. Closed Circuit TV Equipment - Select and use closed-circuit television equipment that will produce a color CD, or DVD.
 - 2. Pipe Inspection Camera - Produce a video using a pan-and-tilt, radial viewing, pipe inspection camera that pans \pm 275 degrees and rotates 360 degrees. The television camera used for the inspection shall be specifically designed and constructed for such inspection. The camera shall be operative in 100% humidity conditions. Use a camera with an accurate footage counter that displays on the monitor the exact distance of the camera (to the nearest tenth of a foot) from the centerline of the starting manhole. Use a camera with camera height adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe being televised. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. A reflector in front of the camera may be required to enhance lighting in dark or large diameter pipe. The video camera shall be capable of showing on the digital inspection the Owner's name, Project name, Contractor name, date, line size and material, line identification (Owner's manhole numbers at both ends) and ongoing footage counter. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Owner; and if unsatisfactory, equipment shall be removed and replaced with adequate equipment. No payment will be made for an unsatisfactory inspection.

2.2 TELEVISION INSPECTION

A. Flow Control

- 1. Perform Bypass Pumping when necessary as specified in Section 812 - Bypass Pumping.
- 2. If during TV inspection of a sewer section, the wastewater flow depth exceeds 20 percent of the inside pipe diameter, reduce the flow depth to an acceptable level by performing the TV inspection during minimum flow hours, bypass pumping, plugging or by pulling the camera with swab, high-velocity jet nozzle or other acceptable dewatering device. Video inspections performed while floating the camera is not acceptable unless approved by the Owner.

B. Documentation of Television Inspection

- 1. All Television Inspections shall be documented using a datalogger and reporting system as approved by the Owner. A PACP compliant datalogger and coding system must be used to perform the Work.

2. Television Inspection Logs: Computer printed location records shall be kept by the Contractor and shall clearly show the location and orientation in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations and orientations of service connections, building sewers, unusual conditions, roots, storm sewer cross connections, broken pipe, presence of scale and corrosion, and other discernible features shall be recorded and a copy of such records shall be supplied to the Owner.
3. Digital Photographs: Noted defects and lateral connections shall be documented as color digital files and color hard copy print-outs. Photo logs shall accompany each photo submitted.
4. Video Recordings: The purpose of video recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. Video recordings shall include an audio track recorded by the inspection technician during the actual inspection Work describing the parameters of the line being inspected (i.e. location, depth, diameter, pipe material), as well as describing connections, defects and unusual conditions observed during the inspection. Video recording playback shall be at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. Once inspected, the CDs/DVDs shall be labeled and become the property of the Owner. The Contractor shall have all video and necessary playback equipment readily accessible for review by the Owner during the project.

C. Pre-Installation Inspection for Sewer Lines to be Rehabilitated

1. Perform pre-installation TV inspection immediately after all point repairs and line cleaning have been completed and immediately before line rehabilitation work. Pre-installation TV inspection is not required for sewer lines designated as remove and replace or point repair only.
2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.
3. If, during the inspection operation, the television camera will not pass through the entire pipe section due to blockage or pipe defect, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole. If, again, the camera fails to pass through the entire pipe section, the inspection shall be considered complete and no additional inspection will be required at that time. Improper cleaning will not be a reason for incomplete televising of a line section.
4. When manually operated winches are used to pull the television camera through the line, hand operated radios, telephones, or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communication between members of the crew.

5. During the internal inspection, the television camera shall be temporarily stopped at each defect along the line. The nature, location, and orientation of the defect shall be recorded by the Contractor. Where defects are also active infiltration sources, the rate of infiltration in gallons per minute shall be estimated by the Contractor and recorded. The camera shall also be stopped at all service connections and identified by footage and clock orientation.
6. The camera operator shall slowly pan and tilt at beginning and ending manhole connections, each service connection, joints, visible defects, and at pipe material transitions.
7. TV inspections shall be continuous for pipe segments between manholes. Do not show a single segment on more than one CD/DVD, unless specifically approved by the Owner.

D. Post - Installation Inspection

1. Post-installation TV inspection shall not be completed until all work, including main line and manhole visual, pressure testing, deflection and leakage testing is complete on a section of line.
2. Post-installation TV inspection shall be completed by the Contractor in the presence of the Owner.
3. The post-installation TV inspection shall be completed to confirm that rehabilitated lines are free of defects. Provide a color video showing the completed work. Prepare and submit Television Inspection Logs providing location of service connections along with location of any discrepancies. Manhole work, including benches, inverts and pipe penetrations into manhole, should be complete prior to post-installation TV Work.
4. For post-installation TV inspection, exercise the full capabilities of the camera equipment to document the completion and the conformance of the work to the Contract Documents. Provide a full 360-degree view of pipe, joints and service connections.
5. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.
6. When manually operated winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being inspected to insure good communication between members of the crew.
7. The importance of accurate distance measurements is emphasized. The meter device shall be accurate to one tenth of a foot.

8. TV inspections shall be continuous for pipe segments between manholes. Do not show a single segment on more than one CD/DVD, unless specifically allowed by the Owner.
9. Prior to inserting the television camera into the pipeline, the Contractor shall flush and clean the pipeline. The Contractor shall introduce a minimum of 1,000 gallons of clear, potable water into the terminal upstream manhole or last access structure on any given gravity sewer branch of the pipeline to be inspected with a television camera. The Contractor is responsible for acquiring, collecting and disposing of the water, at no additional cost to the Owner.

E. Acceptance of Television Inspection Results

Television inspection results will be accepted by the Owner when the video and inspection logs meet the requirements of this specification section.

III. MEASUREMENT FOR PAYMENT

- A. Television Inspections shall be measured based on linear feet of mainline sewer televised and clearly displayed on CDs, or DVDs.
- B. In Support of Rehabilitation Activities: No separate payment shall be made for pre-installation or post-installation inspection footage.
- C. CCTV Only: Payment will be made based on the unit price bid per linear feet of inspection of mainline sewer accepted by the Owner upon review of the inspection CDs/DVDs and logs. Contractor will not be paid for Unaccepted Television Inspection footage.

End of Section